Claims

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4   1.   An array of chemical compounds attached to a support, wherein each compound is
5   attached to a pre-determined portion of the support.

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7   2.   The array of claim 1, prepared by a method which comprises the steps of:
8   providing a support having reactive functionalities;
9   subjecting said support to a set of reagents or reaction conditions, wherein each of said
10   reagents or reaction conditions cycles with a specific period along the support, and wherein each
11   individual reagent or reaction condition in the set is identified as a function of a unique distance
12   or time; and
13   subjecting said support to one or more additional set of reagents or reaction conditions,
14   wherein each of said reagents or reaction conditions cycles with a specific period along the
15   support, and wherein each individual reagent or reaction condition in said one or more sets is
16   identified as a function of unique distance or time, until a desired array of compounds is
17   obtained.
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19   3.   The array of claim 1, prepared by a method which comprises the steps of:
20   a) providing a support having reactive functional groups,
21   b) winding the support around a geometric template,
22   c) dividing the surface of the template lengthwise into regions,
23   d) subjecting each region to one or more reagents or reaction conditions so as to attach
24   reactive moieties or to modify the functional groups; and
25   e) repeating steps (b) through (d) until the desired library is obtained.

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27   4.   The array of claim 3, wherein the reactive moieties have additional functional groups
28   which are masked by protecting groups, and wherein these protecting groups are removed prior
29   to treatment with one or more reagents or reaction conditions.

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5.   The array of claim 1, wherein the identity of each compound in said array is uniquely specified by its location on the support.

6.   The array of claim 1, wherein each of said compounds is synthesized from one or more reagents, and wherein each of said one or more reagents is added at a specific repeat frequency, defined at a specific location on the support.

7.   The array of claim 1, wherein said array is one-dimensional.

8.   A method of preparing an array of compounds comprising the steps of:

providing a support having reactive functionalities;

subjecting said support to a set of reagents or reaction conditions, wherein each of said reagents or reaction conditions cycles with a specific period along the support, and wherein each individual reagent or reaction condition in the set is identified as a function of a unique distance or time; and

subjecting said support to one or more additional set of reagents or reaction conditions, wherein each of said reagents or reaction conditions cycles with a specific period along the support, and wherein each individual reagent or reaction condition in said one or more sets is identified as a function of unique distance or time, until a desired array of compounds is obtained.

9.   The method of claim 8, wherein said thread comprises a support consisting of a single material.

10.   The method of claim 9, wherein said support comprises a single surface derivatized material.

11.   The method of claim 8, wherein said support comprises a composite support.

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12. The method of claim 8, wherein said support comprises a discontinuous synthesized support arrayed on a continuous structural support.

13. 14. The method of claim 8, after the step of providing a support, further comprising:

winding the support around a geometric template; and

dividing the surface of the geometric template into parallel regions.

14. 15. The method of claim 14, wherein said support comprises a geometric template selected from the group consisting of cylinder, prism of polygonal cross section, cylinder with ridges to distinguish regions, flat plate, and conic section.

15. 16. The method of claim 8, wherein the linear array of compounds comprises an array of compounds comprising a contiguous portion of a linear sequence of compounds and represents an optimally diverse subset.

16. 17. The method of claim 8, wherein the linear array of compounds comprises an array of compounds synthesized from a support longer than necessary to produce a single copy of each library member, and thus provides a set of duplicates to evaluate reproducibility.

17. 18. The method of claim 8, wherein the step of providing a linear array of compounds comprises providing an array of compounds in which each possible combination is represented once.

18. 19. A method of preparing a chemical array, which comprises the steps of

a) providing a support having reactive functional groups,

b) winding the support around a geometric template,

c) dividing the surface of the template lengthwise into regions,

d) subjecting each region to one or more reagents or reaction conditions so as to attach reactive moieties or to modify the functional groups; and

e) repeating steps (b) through (d) until the desired library is obtained.

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20. The method of claim 19, wherein the reactive moieties have additional functional groups which are masked by protecting groups, and wherein these protecting groups are removed prior to treatment with one or more reagents or reaction conditions.

21. The method of claim 19, wherein said support comprises a geometric template selected from the group consisting of cylinder, octagon, hexagon, rectangle, and cylinders with ridges to distinguish regions.

22. The method of claim 19, wherein the linear array of compounds comprises an array of compounds comprising a contiguous portion of a linear sequence of compounds and represents an optimally diverse subset.

23. The method of claim 19, wherein the linear array of compounds comprises an array of compounds synthesized from a support longer than necessary to produce a single copy of each library member, and thus provides a set of duplicates to evaluate reproducibility.

24. The method of claim 19, wherein the linear array of compounds comprises an array of compounds in which each possible combination is represented once.

25. A method of measuring a property of each of the chemical compounds in an array comprising the steps of:

    providing a linear array of chemical compounds, such that the identity of each of the compounds is a function of distance or time with respect to the start of the array;

    assaying compounds in an array to detect those compounds having a specific desired activity; and

    transporting said linear array of compounds at a constant velocity through an appropriate detector capable of detecting compounds having a specific desired activity.

26. The method of claim 25, wherein each of the compounds is attached to a support.

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27. The method of claim 26, wherein each of the compounds is assayed while attached to the support.

28. The method of claim 25, wherein each of the compounds is cleaved from the support prior to the step of assaying.

29. The method of claim 25, wherein the linear array of compounds comprises an array of compounds comprising a contiguous portion of a linear sequence of compounds and represents an optimally diverse subset.

30. The method of claim 25, wherein the linear array of compounds comprises an array of compounds synthesized from a support longer than necessary to produce a single copy of each library member, and thus provides a set of duplicates to evaluate reproducibility.

31. The method of claim 25, wherein the linear array of compounds comprises an array of compounds in which each possible combination is represented once.

32. A method of assaying chemical compounds for binding to fluorescent species comprising:
    preparing an array of compounds on a linear optical fiber;
    contacting said array of compounds in solution with fluorescent species;
    exciting said fluorescent species by providing a light source; and
    detecting specific library members capable of binding to fluorescent species.

33. The method of claim 32, wherein the steps of exciting said fluorescent species and detecting specific library members comprises an apparatus capable of simultaneously providing a light source and moving said support at a constant rate through the apparatus, so as to identify the distance or time at which specific compounds that are capable of binding occur, and thereby to identify the identity of the specific compound.

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34. A method of obtaining structure-activity relationships from the compounds in a library, which comprises the steps of:

provliding a linear array of compounds,

measuring the activity of each compound in the library, so as to obtain a datapoint for each compound,

arranging the datapoints in a linear array, in such a way that variable structural features in the library are repeated at fixed intervals in the array, and

mathematically processing the resulting linear array of datapoints by Fourier transformation.

35. The method of claim 34, wherein the step of providing a linear array of compounds comprises providing an array of compounds comprising a contiguous portion of a linear sequence of compounds and represents an optimally diverse subset.

36. The method of claim 34, wherein the step of providing a linear array of compounds comprises providing an array of compounds synthesized from a support longer than necessary to produce a single copy of each library member, and thus provides a set of duplicates to evaluate reproducibility.

37. The method of claim 34, wherein the step of providing a linear array of compounds comprises providing an array of compounds in which each possible combination is represented once.

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